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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/778,029	02/17/2004	Hiroshi Ishiyama	118695	6188
25944	7590	06/16/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			PERALTA, GINETTE	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

ETC

Office Action Summary	Application No. 10/778,029	Applicant(s) ISHIYAMA	
	Examiner Ginette Peralta	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/17/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation “the inner pressure arises in the resin mold in a case where the semiconductor chip works in abnormal operations” is rendered indefinite since “abnormal operations” have not been properly defined thus rendering the claim indefinite.

3. Claim 18 recites the limitation "second semiconductor chip" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkouchi (U. S. Pat. 6,845,012 B2) in view of Kodama et al. (U. S. Pat. 6,495,924 B2).

Regarding claim 1, Ohkouchi discloses in Fig. 1, a semiconductor module that comprises a semiconductor chip (101a, 101b) having a first surface and a second surface; a first electrode plate 103 contacting the first surface of the semiconductor chip (101a, 101b); a second electrode plate 102 contacting the second surface of the semiconductor chip (101a, 101b); and a resin mold 19 for sealing the first (103) and second (102) electrode plates and the semiconductor chip (101a, 101b).

Ohkouchi discloses the claimed invention with the exception of the resin mold including an inner pressure release portion.

Kodama et al. discloses in Figs. 1, 2(a)-2(c), and 11, a semiconductor chip (1, 31) having a first surface and a second surface; a first electrode plate (3, 33) contacting the first surface of the semiconductor chip (1, 31); a second electrode plate (2, 32) contacting the second surface of the semiconductor chip (1, 31); and a resin (6, 42) that includes an inner pressure release portion for releasing an inner pressure in the module, wherein the resin that includes an inner pressure release for releasing an inner pressure in the module is taught for the disclosed intended purpose of accommodating the variation in height of the contacting planes (warps, waviness, variation in dimensions of the members, and the like), and of decreasing the thermal resistance and electrical resistance at the contacting boundary plates as disclosed in col. 3, lines 4-9.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the semiconductor module of Ohkouchi a resin with an inner pressure release portion as Kodama teaches for the disclosed intended purpose of accommodating the variation in height of the contacting planes (warps, waviness, variation in dimensions of the members, and the like), and of decreasing the thermal resistance and electrical resistance at the contacting boundary plates as disclosed in col. 3, lines 4-9.

Regarding claim 2, Ohkouchi discloses that the first electrode plate 103 includes a first electrode and a signal terminal 103b, which protrude from the resin mold 19; and the second electrode plate 102 includes a second electrode 102, which protrudes from the resin mold, as shown in Fig. 1 and described in col. 5, lines 26-35.

Regarding claim 3, Ohkouchi as modified by Kodama et al. discloses that the inner pressure arises due to abnormal conditions such as warps, waviness, and the appearance of thermal and electrical resistances.

Regarding claim 4, Ohkouchi discloses in Fig.1 that the first electrode plate 103 includes a body, which is exposed outside of the resin mold 19; and wherein the second electrode plate 102 includes a body, which is exposed outside of the resin mold 19.

Regarding claim 5, Ohkouchi discloses in Fig. 1 that the semiconductor chip (101a, 101b) is sandwiched by the first and second electrode plates, 103 and 102, and embedded in the resin mold 19.

Regarding claim 6, Ohkouchi as modified by Kodama et al. discloses that the inner pressure release portion 6 is made of resin material having low adhesiveness to the resin mold, and wherein the inner pressure release portion 6 is a resin rod embedded in the resin mold as described in col. 6, lines 18-49, and col. 14, lines 36-67, and as shown in Figs. 2(a), 16, 17(a) and 17(b), where it is described that the portion 6 may comprise resin fibers coated with metal, and in Fig. 16 is shown an arrangement of the fibers surrounded by metal.

Regarding claim 7, Ohkouchi as modified by Kodama et al. discloses that the resin rod extends from a surface of the semiconductor chip to outside of the resin mold.

Regarding claim 8, Ohkouchi as modified by Kodama et al. discloses that the resin mold 19 includes a hole (region 104 of Ohkouchi), wherein the resin rod is inserted into the hole of the resin mold 19, and wherein the resin rod is removable from the hole so that a clearance is formed between the resin rod and the hole.

Regarding claim 9, Ohkouchi as modified by Kodama et al. discloses that the inner pressure release portion 6 works in such a manner that the inner pressure in the resin mold is released through the clearance between the resin rod and the hole.

Regarding claim 10, Ohkouchi as modified by Kodama et al. discloses that upon exerting pressure the rods can be flattened as shown in Fig. 2(c), and thus some of the fibers (rods) may be pushed out of the hole.

Regarding claim 11, Ohkouchi as modified by Kodama et al. discloses that the inner release portion 6 works in such a manner that the inner pressure in the resin mold is released through the hole after the resin rods or fibers drop out of the hole.

Regarding claim 12, Ohkouchi discloses in Fig. 1, a semiconductor module that comprises a semiconductor chip (101a, 101b) having a first surface and a second surface; a first electrode plate 103 contacting the first surface of the semiconductor chip (101a, 101b); a second electrode plate 102 contacting the second surface of the semiconductor chip (101a, 101b); and a resin mold 19 for sealing the first (103) and second (102) electrode plates and the semiconductor chip (101a, 101b).

Ohkouchi discloses the claimed invention with the exception of each of the first and second electrode plates includes an inner pressure release portion for releasing an inner pressure in the resin mold.

Kodama et al. discloses in Figs. 1, 2(a)-2(c), and 10, a semiconductor chip (1, 31) having a first surface and a second surface; a first electrode plate (3, 33) contacting the first surface of the semiconductor chip (1, 31); a second electrode plate (2, 32) contacting the second surface of the semiconductor chip (1, 31); and a resin (6, 34, and 35) that includes an inner pressure release portion for releasing an inner pressure in the module, wherein in some embodiments the inner pressure release portion is included in the first electrode and in others is included in the second electrode plate; and wherein the resin that includes an inner pressure release for releasing an inner pressure in the module is taught for the disclosed intended purpose of accommodating the variation in height of

the contacting planes (warps, waviness, variation in dimensions of the members, and the like), and of decreasing the thermal resistance and electrical resistance at the contacting boundary plates as disclosed in col. 3, lines 4-9.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the semiconductor module of Ohkouchi a resin with an inner pressure release portion as Kodama teaches for the disclosed intended purpose of accommodating the variation in height of the contacting planes (warps, waviness, variation in dimensions of the members, and the like), and of decreasing the thermal resistance and electrical resistance at the contacting boundary plates as disclosed in col. 3, lines 4-9.

Regarding claim 13, Ohkouchi discloses that the first electrode plate 103 includes a first electrode and a signal terminal 103b, which protrude from the resin mold 19; and the second electrode plate 102 includes a second electrode 102, which protrudes from the resin mold, as shown in Fig. 1 and described in col. 5, lines 26-35.

Regarding claim 14, Ohkouchi as modified by Kodama et al. discloses that the inner pressure arises due to abnormal conditions such as warps, waviness, and the appearance of thermal and electrical resistances.

Regarding claim 15, Ohkouchi discloses in Fig.1 that the first electrode plate 103 includes a body, which is exposed outside of the resin mold 19; and wherein the second electrode plate 102 includes a body, which is exposed outside of the resin mold 19.

Regarding claim 16, Ohkouchi discloses in Fig. 1 that the semiconductor chip (101a, 101b) is sandwiched by the first and second electrode plates, 103 and 102, and embedded in the resin mold 19.

Regarding claim 17, Ohkouchi as modified by Kodama et al. discloses that the inner pressure release portion 6 is a starting point for deforming the first and second electrode plates so that the inner pressure is released.

Regarding claim 18, Ohkouchi as modified by Kodama et al. discloses that the starting point does not overlap the first semiconductor chip.

Regarding claim 19, Ohkouchi as modified by Kodama et al. discloses that each of the first and second electrode plates includes the starting point and an other portion; and wherein the other portion is deformable so that a clearance is formed between the other portion and the resin mold 19.

Regarding claim 20, Ohkouchi as modified by Kodama et al. discloses that the inner pressure release portion (6, 34, 35) works in such a manner that the inner pressure in the resin mold is released through the clearance.

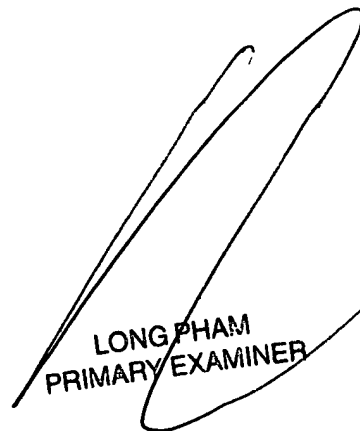
Regarding claim 21, Ohkouchi as modified by Kodama et al. discloses that the inner pressure release portion (6, 34, 35) is a concavity or convexity for deforming the first and second electrode plates so that the inner pressure is released.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (571) 272-1713. The examiner can normally be reached on Monday to Friday 8:00 AM- 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GP



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PRIMARY EXAMINER